

BIO_3

Title of the doctoral program

Bioengineering and Medical-Surgical Sciences

Title of the research activity

Bioartificial Organ Models in the investigation of age-related diseases

Short description of the research activity

The research activity will be focused on the development of advanced three-dimensional polymeric matrices (biomatrices) able to reproduce the biochemical, mechanical and morphological properties of the Extracellular Matrix (ECM) of specific tissues. Both physiological and pathological tissues will be studied, in order to garner a better understanding of each process. The engineering of biomatrices will be achieved through nanotechnology tools, such as the synthesis of suitable polymers with a modular block structure (e.g. polyurethanes), the design of porous scaffold (by conventional or advanced processing method) and the nanoscale surface modification with bioactive molecules (by plasma or layer-by-layer techniques).

The polymeric organ models will be used in in vitro dynamic culture models, mimicking in vivo conditions, and in vitro toxicology testing, as animal models alternatives in disease investigation.

Scientific responsible (name, surname, role, email)

Gianluca Ciardelli, Full professor, gianluca.ciardelli@polito.it

Number of vacancies for XXXI cycle (3 years program)

1

Specific requirements (experiences, skills)

Background in materials science/engineering or biomedical engineering

Website of the research group (if any)

http://www.dimec.polito.it/it/la_ricerca/gruppi/bioingegneria_industriale/current_research_topics